SECTION 1
INTRODUCTION

1.1 NEED FOR THE REPORT

The United States Section of the International Boundary and Water Commission (USIBWC) is evaluating long-term river management alternatives for the Rio Grande Canalization Project (RGCP). The RGCP is a narrow river corridor that extends 105.4 miles along the Rio Grande, from below Percha Dam in Sierra County, New Mexico to American Dam in El Paso, Texas. The river management alternatives under consideration address practices such as stream bank stabilization, erosion reduction, and flood control, as well as environmental measures intended to support restoration of native riparian vegetation and diversification of aquatic habitats along the RGCP.

Consideration of decisions to be made regarding river management alternatives requires preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) of 1969. The EIS process entails formulation of alternatives, preparation of a draft EIS for review by regulatory agencies and the general public, and completion of a final EIS addressing comments received during the draft EIS review period. As a final step, a Record of Decision is prepared to define the selected course of action and the need for mitigation measures. Figure 1-1 presents the EIS within the framework of the NEPA process for evaluation of impacts for river management alternatives for the RGCP.

The USIBWC issued a Notice of Intent for EIS preparation in August 1999, and conducted two public scoping meetings during October 1999 in Las Cruces, New Mexico, and El Paso, Texas. Preliminary alternatives were then developed and presented for stakeholder review during two technical workshops conducted in September 2000 in El Paso, Texas, and a public meeting in Las Cruces, New Mexico in October 2000. The Alternatives Formulation Report (AFR) was issued in March 2001 as the basis to determine potential impacts associated with river management alternatives for the RGCP (Parsons 2001a).

Following preparation of the AFR, the USIBWC conducted additional meetings and focused workshops with representatives of regulatory agencies, irrigation districts, and environmental organizations. These additional meetings were conducted to address comments and concerns expressed to the USIBWC by stakeholders after review of the AFR posted on the USIBWC website. Based on input from additional stakeholder contacts, river management alternatives and associated environmental measures were modified to further address stakeholders' concerns and recommendations.

This report, the Reformulation of River Management Alternatives for the RGCP (Reformulation Report), documents modifications to the alternatives since preparation of the AFR, and the rationale for these modifications. The Reformulation Report, as well as the previously completed AFR, describe alternatives under consideration, and are not intended to assess potential impacts. Detailed environmental impacts will be addressed in the draft EIS that will be available for public review.

NEPA PROCESS

Project Definition and Review

Categorical Exclusion

Finding of No Significant Impact

Environmental Assessment

Major Federal Action

Environmental Impact Statement

Notice of Intent

Scoping

Formulation of Alternatives

Draft EIS

Public and Agency Review

Final EIS

Public and Agency Review

USIBWC Decision

Record of Decision

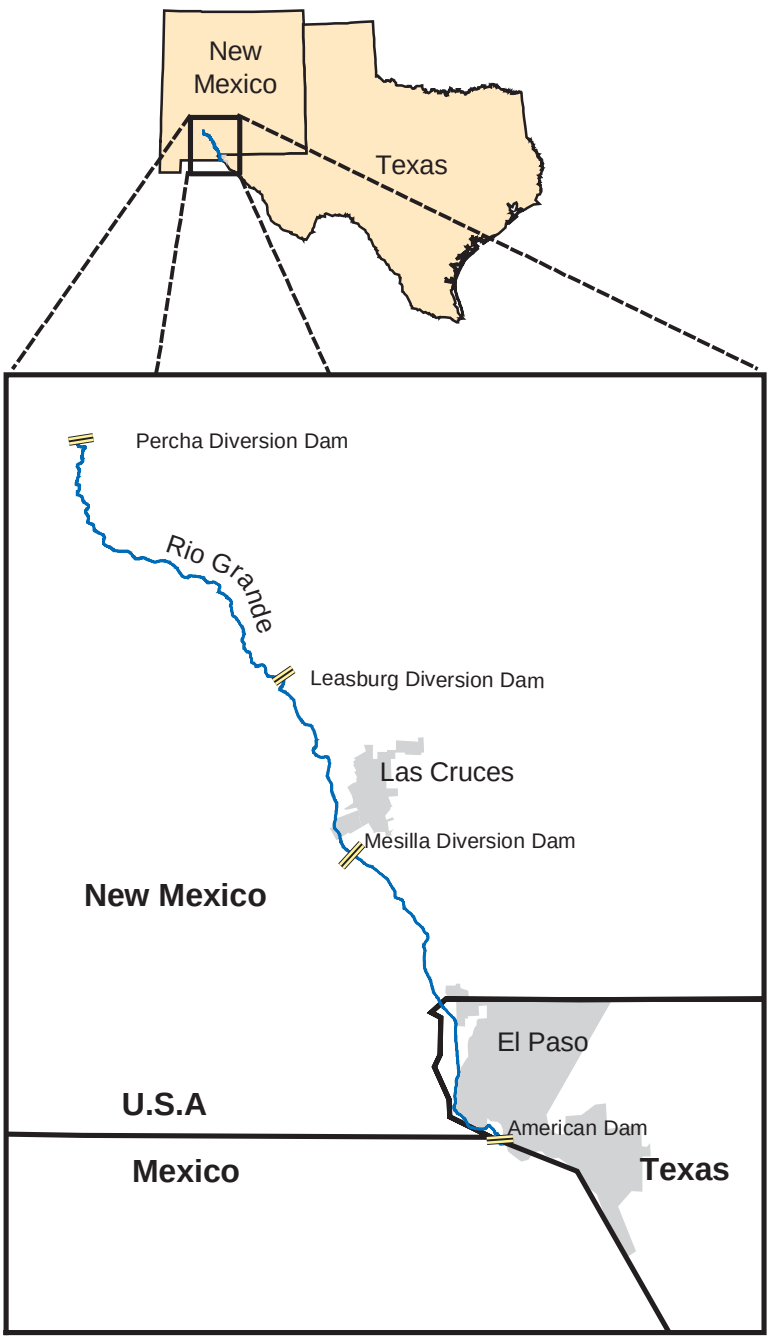

Figure 1-1

NEPA Process and RGCP Location

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1.2 REFORMULATION REPORT ORGANIZATION

The Reformulation Report provides information on the report need, the reformulation and stakeholder consultation process, reformulated alternatives description and implementation strategy, and major technical issues evaluated as the basis for the reformulation. This information was organized in four sections as follows.

- Section 1 presents a statement of report need, and provides background information on the RGCP construction and operation. A summary of the March 2001 AFR is included presenting initially formulated river management alternatives, formulation approach, and extent and locations of environmental measures.
- Section 2 describes the reformulation process, chronology of stakeholder involvement, and major issues and concerns. Changes to the alternatives relative to those presented in the AFR are discussed as well as a summary of changes to environmental measures. Section 2 concludes with the identification by alternative of projects selected for implementation.
- Section 3 describes the No Action Alternative and three action alternatives in terms of management of the levee system, floodway, pilot channel, and sediment, as well as applicable projects. An implementation strategy, discussing the need for water acquisition and cooperation agreements, is subsequently described along with an implementation timetable.
- Section 4 describes four major issues addressed in the reformulation:
    a. Water issues, including water availability and the strategy for water acquisition.
    b. River configuration and sediment transport, indicating the extent of historical changes and limited role of the canalization on current RGCP geometry.
    c. Flood control strategies and their potential to support river restoration.
    d. River restoration based on the analysis of opportunities and constraints. Application of the partial restoration concept is described, using riparian corridor development and aquatic diversification as the primary restoration goals for the RGCP.

Support information used in the alternatives reformulation, as well as detailed technical analyses, are provided in appendices found in the attached CD (PDF format). Those appendices are: a comparison of the pre-construction and current river channel configuration (Appendix A); a description of River Management Units (Appendix B); the Alternatives Formulation Report (Appendix C); presentations to stakeholders since completion of the AFR (Appendix D), as well as relevant correspondence for the reformulation (Appendix E); an evaluation of controlled water releases from Caballo Dam (Appendix F); color infrared images of the RGCP (Appendix G); and RGCP construction drawings (Appendix H).

1.3 BACKGROUND INFORMATION

1.3.1 Rio Grande Canalization Project

The RGCP was constructed between 1938 and 1943, as authorized by an Act of Congress approved June 4, 1936 (49 Stat. 1463), to facilitate compliance with the 1906 Convention between the United States and Mexico, and to properly regulate and control, to the fullest extent possible, the water supply for use in the two countries as provided by the treaty. The RGCP includes the river channel and adjoining land right-of-way (ROW) for which the USIBWC has legal control. The RGCP extends for 105.4 river miles along the Rio Grande, from the Percha Diversion Dam in Sierra County, New Mexico, to the vicinity of the American Diversion Dam in El Paso County, Texas.

The 1936 Act authorized the construction and operation and maintenance (O&M) of the RGCP in agreement with the Engineering Record Plan of December 14, 1935 (Baker 1943). Major elements of the plan were acquisition of ROW for the river channel and adjoining floodways; improvement of the alignment and efficiency of the river channel conveyance for water delivery; and flood control measures that extend through the Rincon and Mesilla Valleys of New Mexico and El Paso Valley in Texas. As part of the RGCP, a deeper main channel was dredged to facilitate water deliveries for irrigation, and flood protection levees were placed along two-thirds of its length.

Since completion of the RGCP, a significant operational change was the construction of sediment/flood control dams in tributary arroyos in the early 1970s by the United States Natural Resources Conservation Service (NRCS). A combination of flood control dams at Broad Canyon, Green Canyon, Arroyo Cuervo, and Berrenda Arroyo, controls discharges over 300 square miles of the RGCP tributary basin, and reduce the flood peak frequency by an estimated 40 percent (USACE 1996).

1.3.2 Current Operation of the RGCP

The USIBWC has been responsible for maintaining the flood control and water delivery capabilities of the RGCP since its completion in 1943. To accomplish this mission the agency performs O&M activities consisting of sediment removal from the channel and lower end of the arroyos; leveling of the floodway; vegetation management along channel banks, floodway, and levees; replacement of channel bank riprap; care of dams on arroyos; and maintenance of infrastructure such as levee roads, bridges, and gates at the American Diversion Dam.

Throughout the years, the USIBWC has strived to incorporate environmental measures and operate and maintain the RGCP to enhance environmental conditions while complying with the Congress-mandated mission of flood control and efficient water deliveries to the States of New Mexico and Texas, and to Mexico. Environmental measures included limited planting of cottonwood trees, selective mowing to retain native vegetation and control salt cedar, test areas of limited mowing, and use of artificial in-stream structures to diversify aquatic habitat as required by a Section 404 dredging permit issued by the USACE.

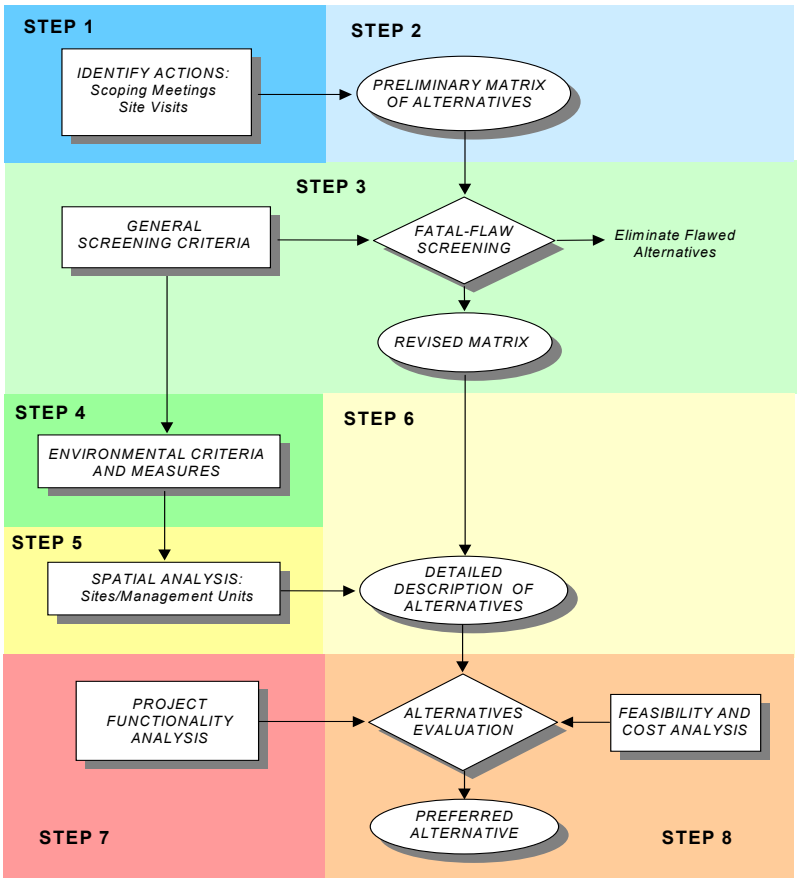
1.3.3 Alternatives Formulation Report Summary

Alternatives Formulation Process

Figure 1-2 illustrates the approach used in the March 2001 AFR to incorporate environmental measures into the river management alternatives while accomplishing the USIBWC mission and United States treaty requirements. The formulation framework encompassed the following elements:

- Preservation of flood control functions along the RGCP;
- Continued water deliveries to Mexico and United States users;
- Incorporation of environmental measures for riparian restoration and diversification of aquatic habitats;
- Continued cooperative efforts with local interests and long-term lease contracts to promote development of park/recreational areas within the ROW, and
- Water quality protection.

Figure 1-2 Initial Alternatives Formulation Process (Parsons 2001a)



Alternatives

A comprehensive list of potential environmental measures and O&M practices was used to prepare the AFR (Parsons 2001a). The list was compiled from multiple sources, including:

- Public scoping (Parsons 1999);
- Stakeholder meetings (Parsons 2001a);
- Projects and actions specified by the USIBWC for current O&M activities, and plans for river management and future construction;
- Previous experience of the USIBWC and its consultants on habitat improvement and restoration projects (USIBWC and EPWU/PSB 2000; Parsons 2000b); and
- Management issues identified by other agencies, various organizations, and the general public during public scoping meetings.

The list of potential environmental measures was screened based on compatibility with project functionality, primarily flood containment. Hydraulic modeling was used to identify locations and potential changes in levee functionality along the RGCP due to implementation of environmental measures.

Four action alternatives were screened in the AFR for evaluation in the EIS. Main features of these alternatives, along with the No Action Alternative, are listed below. Table 1-1 identifies measures associated with each action alternative, as formulated in the AFR.

(1) Current Operation (No Action Alternative). Under this alternative current O&M practices were maintained in terms of sediment dredging and disposal, vegetation management, land leases, as well as test no-mow zones and existing aquatic habitat structures.

(2) Selective Operation and Maintenance Modification. Main components of this alternative were partial rehabilitation and improvements to the flood control system, in-channel erosion control measures (Rincon and Hatch siphons and Picacho flume), placement of additional aquatic habitat structures at current mitigation sites, reduction in sediment dredging, and expansion of no-mow zones.

(3) Integrated USIBWC Land Management. This alternative included most environmental measures from the Selective O&M Modification Alternative, plus placement of additional aquatic habitat structures; enhancements of riparian and terrestrial habitats at multiple locations; and modifications to spoil disposal practices and grazing leases.

(4) Targeted River Restoration. In addition to environmental measures incorporated into the Integrated USIBWC Land Management Alternative, this alternative included acquisition of flood easements, limited levee setbacks, planting sites outside the ROW, and re-opening of a number of river meanders within the ROW.

Table 1-1 Initial Formulation of Alternatives

CATEGORY / ACTION		Selective O&M Modification	Integrated USIBWC Land Management	Targeted River Restoration	Multipurpose Watershed Management
PROJECT FUNCTIONALITY (USIBWC MISSION)	**Unit**				
Raise levees (2 ft. average)	mile	55	55	55	55
Add levees or floodwalls	mile	9	9	9	9
Modify dredging at arroyos	event	10	10	10	10
Modify spoil disposal locations/practices	1000 yd3	200	200	200	200
Reduce dredging of pilot channel	1000 yd3	450	450	450	450
Levee setbacks	mile			6	6
Acquire flood easements for levee setbacks	acre			133	133
Reduce runoff entering river during floods	n/a				yes
Erosion control in tributaries	number				10
AQUATIC/RIPARIAN HABITAT MEASUREMENTS					
Water Diversion Structures & Siphons					
Erosion protection structures	number	3	3	3	3
Provide white water/back-water habitat	acre	14	14	14	14
Spillways/Drains					
Reduced maintenance	acre	154	154	154	154
Enhance wetlands	acre	36	36	36	36
Land Management					
Modify leases within ROW	acre		881	881	881
Additional no-mow zones (excluding leases)	acre		488	488	488
Easements/land acquisition / for habitat	acre			1183	1183
Control salt cedar outside ROW	acre			914	914
Planting sites outside ROW	acre			160	160
Mouth of Arroyos/Canyons					
Additional groin locations	number		18	18	18
Additional weir/embayment locations	number		38	38	38
Create/expand wetlands	acre		93	93	93
Arroyo habitat diversification	number		5	5	5
Riparian Vegetation Sites					
Expand remnant bosques/riparian veg.	acre		249	249	249
Control invasive vegetation (salt cedar)	acre		1062	1062	1062
Planting sites within ROW	acre		197	197	197
RESTORATION OF FLUVIAL PROCESSES					
Old Meanders					
Reopen meanders ROW (eight)	acre		109	109	109
New meanders outside ROW	acre			47	47
Bank overflow by shave downs	acre			33	33
Create/expand wetlands outside ROW	acre			95	95
Flow Regime Modification					
Allow seasonal peak flows	n/a				yes
Establish minimum in-stream flows	n/a				yes
MULTIPURPOSE PROJECT MANAGEMENT					
Add recreational areas	acre				14
Interagency cooperation agreements	n/a				yes
Improve water conservation	n/a				yes
Improve water quality	n/a				yes

(5) Multipurpose Watershed Management. This alternative included most environmental measures from the Targeted River Restoration Alternative, plus sediment control measures in tributary sub-basins, addition of recreational areas, measures intended to improve water quality, and potential use of seasonal peak flows for establishment of riparian vegetation.

Measures for the first three alternatives were limited to lands under USIBWC jurisdiction (current ROW), while some of the measures for the Targeted River Restoration and Multipurpose Watershed Management Alternatives would extend beyond the current ROW through easements, land acquisitions, cooperative agreements, or other mechanisms.

Extent and Location of Potential Environmental Measures

In general, the sequence of alternatives from the Selective O&M Modification Alternative through the Multipurpose Watershed Management reflected a cumulative increase in environmental measures. That is, each alternative contained most of the elements from the preceding alternative plus additional measures.

Forty-eight sites along the RGCP were identified as the most suitable for implementation of environmental measures. The majority of those sites were located within the flood plain under USIBWC jurisdiction. Figure 1-3 illustrates the location of individual sites identified along the RGCP.

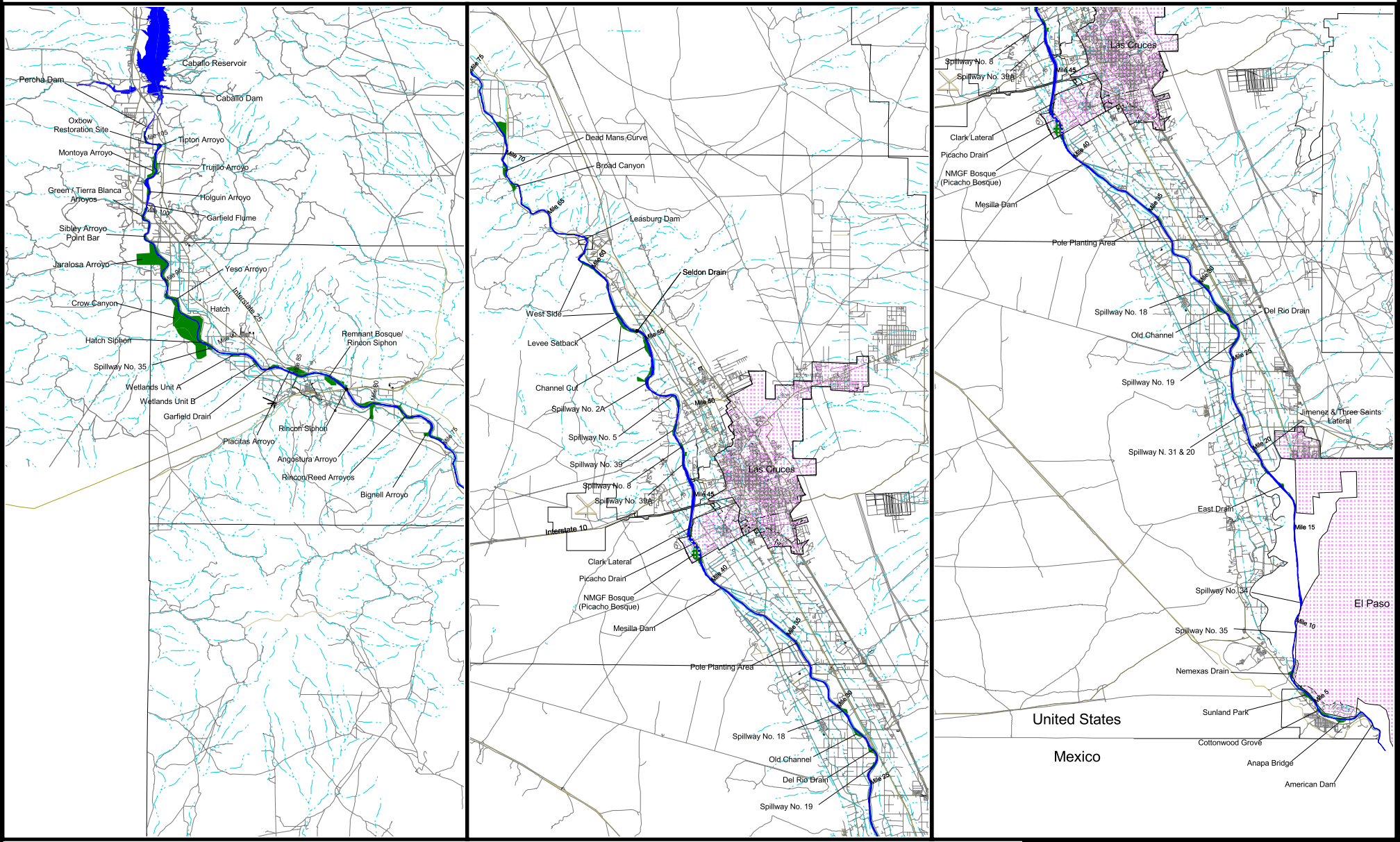


Figure 1-3

Potential Locations for Implementation of Environmental Measures (Parsons 2001)

Rio Grande Canalization Project